

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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For : TIRE

Art Unit & Examiner : 1791, Mr. Steven D. Maki

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Sir:

I, Osamu UCHINO, in care of 3-1-1, Ogawahigashi-cho Kodaira-shi, Tokyo, Japan, declare that;

1. I graduated from Tokyo University of Agriculture and Technology and received my master's degree of Engineering in March 1996, and joined BRIDGESTONE CORPORATION in April 1996. Then, I have been engaged in the research and development of tire materials including development of compounding ingredients in Consumer Tire Compounds Development Department up to the present.

2. I am familiar with the subject matters disclosed in the application. The following experiments were carried out by me.

### 3. Experiments

#### (1) Procedure of the Experiments

Additional Examples AA and BB and additional Comparative Examples J to M were carried out in the same process as Examples 14 and 15 in Table 2 described in the specification of this invention.

The non-vulcanized rubber compositions obtained above were evaluated for a Moony viscosity, and the vulcanized rubber compositions were evaluated for a dynamic storage elastic modulus ( $E'$ ), a driving stability, a wet gripping property and an abrasion resistance by the methods described in the specification of this invention.

#### (2) Results

The results obtained are shown in the following Table.

Table

Rubber composition blended (mass part)	Example		Comparative Example				
	AA	BB	J	K	L	M	
Rubber component: SBR (oil extended) <sup>*10</sup>	137.5	137.5	137.5	137.5	137.5	137.5	
butadiene rubber <sup>*11</sup>	-	-	-	-	-	-	
natural rubber	-	-	-	-	-	-	
Filler: carbon black <sup>*12</sup>	45	45	45	45	45	45	
silica <sup>*13</sup>	45	45	45	45	45	45	
aluminum hydroxide <sup>*14</sup>	-	-	-	-	-	-	
Partial ester <sup>*15</sup>	1.5	1.5	-	1.5	-	-	
Silane coupling agent <sup>*16</sup>	4.5	4.5	4.5	4.5	4.5	4.5	
Resin: resin A <sup>*17</sup>	5	5	-	-	5	5	
resin B <sup>*18</sup>	-	5	-	-	-	5	
(Mass % of silica in the filler)	50	50	50	50	50	50	
(Total oil amount)	37.5	37.5	37.5	37.5	37.5	37.5	
Evaluation results:							
Mooney viscosity (ML <sub>1+4</sub> )	58	58	76	60	77	76	
Dynamic storage elastic modulus E' (MPa)	14.8	16.2	10.8	10.2	13.5	15.4	
Driving stability (index)	110	115	92	90	104	111	
Wet gripping property (index)	119	118	106	106	117	119	
Abrasion resistance (index)	88	89	90	91	90	90	

## Remarks:

- \*10 SBR (oil extended): brand name "SBR 1712" (oil-extended rubber containing 37.5 mass parts of an aromatic oil per 100 mass parts of rubber component, manufactured by JSR Co., Ltd.)
- \*11 Butadiene rubber: brand name "BR01" (cis-1,4-polybutadiene, manufactured by JSR Co., Ltd.)
- \*12 Carbon black: SAF grade (manufactured by Tokai Carbon Co., Ltd.)
- \*13 Silica: brand name "Nipseal AQ" ( $N_2SA: 210 \text{ m}^2/\text{g}$ , manufactured by Nippon Silica Ind. Co., Ltd.)
- \*14 Aluminum hydroxide: brand name "Higilite 43M" (manufactured by Showa Denko Co., Ltd.)
- \*15 Partial ester: mono[POP(5) lauryl ether] maleic acid ester
- \*16 Silane coupling agent: brand name "Si 69" (manufactured by Degussa Co., Ltd.)
- \*17 Resin A:  $C_5$  base petroleum resin (manufactured by Struktol Co., Ltd.)
- \*18 Resin B: brand name "Novatec" (polyethylene base resin, manufactured by Japan Polychem Corp.)

4. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 2010. 7. 21By: Osamu Uchino

Osamu UCHINO